REMARKS

Claims 1-5 are pending in the application. Claims 1 and 2 have been amended in order to more particularly point out, and distinctly claim the subject matter to which the applicant regards as his invention. Claims 6-12 have been newly added. The applicant respectfully submits that no new matter has been added. It is believed that this Amendment is fully responsive to the Office Action dated **July 17, 2003.**

Claim Objections

The Examiner has objected to claims 1 and 2 as containing minor informalities. Applicants have amended these claims, in accordance with the Examiner's suggestions. Thus, reconsideration and withdrawal of the objection of these claims is respectfully requested.

Claim Rejections under 35 USC §103

Claims 1, 5 are rejected under 35 USC §103(a) as being unpatentable over Sakai (U.S. Patent 5,206,730) in view of Kaneko et al. (U.S. Patent No. 5,262,868) further in view of Hidetoshi et al., (Japanese Patent No. 06-022262).

The present invention is a digital camera having the capability of still image recording in which a single scene is recorded and motion image recording in which a number of scenes are recorded. This digital camera uses a battery to power its operations. The remaining battery voltage

is measured when the shutter button is operated. As shown in step S6 of figure 2, when the camera is in still image recording mode the picture is taken if the remaining battery voltage is greater than or equal to 5% of the battery fully charged capacity. As shown in step S9 of figure 2, when the camera is in motion image recording mode the pictures are taken if the remaining battery voltage is greater than or equal to 25% of the battery fully charged capacity.

Sakai describes describes a digital camera having a battery which is capable of a one shot photographing mode and a serial shot photographing mode.

Kaneko et al. describes a digital camera in which a threshold voltage is compared to the battery voltage supplied. If the battery voltage is less than the threshold voltage then an alarm display is issued and a buzzer sounds.

Hidetoshi et al. describes a camera in which when a battery voltage drops below a 1st power saving reference voltage then the moving picture recording mode is disabled and a display is given to a display device (4) and a signal is given to an audio circuit (5). In a still picture recording mode the battery voltage is compared to a 2nd power saving reference voltage and the camera is disabled if the battery voltage is less than the 2nd power saving reference voltage.

Claim 1 has been amended to include that the first threshold value is less than the second threshold value. A careful review of the English translation of the Abstract of Hidetoshi et al. does not reveal that the 2nd power saving reference voltage is less than the 1st power saving reference voltage.

Therefore, claim 1 patentably distinguishes over the prior art relied upon by reciting,

> "An electronic camera to be driven by a battery, comprising an instruction key for instructing for picture taking; a picture taking means for taking a subject image at least 1 scene in response to operation of said instruction key; a processing means for performing signal processing on a camera signal corresponding to said subject image taken by said picture taking means and creating an image signal; a recording means for recording said image signal created by said processing means to a recording medium; a comparison means for comparing a remaining capacity of said battery with a predetermined threshold value; a disabling means for disabling said instruction key depending upon a result of comparison by said comparison means; a select means for selecting either one of a still image recording mode to picture taking a 1-scene subject image in response to once operating said instruction key and recording said 1-scene image signal to said recording medium, and a continuous image recording mode to picture taking a plurality of scenes of subject images in response to once operating said instruction key and recording said plurality of scenes of image signals to said recording medium; a first enabling means for enabling a first threshold value related to a consumed power required for recording a 1-scene image signal when said still image recording mode is selected; and a second enabling means for enabling a second threshold value related to a consumed power required for recording said plurality of scenes of image signals when said continuous image recording mode is selected, wherein said first threshold value is less than said second threshold value.

Therefore, withdrawal of the rejection of Claims 1, 5 under 35 USC §103(a) as being unpatentable over Sakai (U.S. Patent 5,206,730) in view of Kaneko et al. (U.S. Patent No. 5,262,868) further in view of Hidetoshi et al., (Japanese Patent No. 06-022262) is respectfully requested.

Claims 2, 3 are rejected under 35 USC §103(a) as being unpatentable over Sakai (U.S. Patent No. 5,206,730) in view of Kaneko et al. (U.S. Patent No. 5,262,868) and Hidetoshi et al. (Japanese Patent No. 06-022262) further in view of Misawa (U.S. Patent No. 6,208,380).

Misawa describes a digital camera in which when memory card (12) is not inserted into the camera the camera writes to built-in memory (42) until it is filled.

Claims 2 and 3 are allowable by virtue of their dependence upon an allowable independent claim.

Therefore, withdrawal of the rejection of Claims 2, 3 under 35 USC §103(a) as being unpatentable over Sakai (U.S. Patent No. 5,206,730) in view of Kaneko et al. (U.S. Patent No. 5,262,868) and Hidetoshi et al. (Japanese Patent No. 06-022262) further in view of Misawa (U.S. Patent No. 6,208,380) is respectfully requested.

Claim 4 is rejected under 35 USC §103(a) as being unpatentable over Sakai (U.S. Patent No. 5,206,730) in view of Kaneko et al. (U.S. Patent No. 5,262,868) and Hidetoshi et al. Japanese Patent No. 06-022262) further in view of Ejima (U.S. Patent No. 6,188,432).

Ejima describes a camera having a low speed continuous shooting mode in which 8 frames per second are taken and a high speed continuous shooting mode in which 30 frames per second are taken.

Claim 4 is allowable by virtue of its dependence upon an allowable independent claim.

Therefore, withdrawal of the rejection of Claim 4 under 35 USC §103(a) as being unpatentable over Sakai (U.S. Patent No. 5,206,730) in view of Kaneko et al. (U.S. Patent No. 5,262,868) and Hidetoshi et al. Japanese Patent No. 06-022262) further in view of Ejima (U.S. Patent No. 6,188,432) is respectfully requested.

New Claims

New claims 6-12 are added to this application.

According to claim 7, an object is imaged by an imaging device. Regarding a recording mode, there are two modes: one is a first mode for recording one screen of image signal corresponding to an image object which is imaged by the imaging device, and a second mode for recording a plurality of screens of image signals corresponding to the object images which are imaged by the imaging device, and any one of the recording modes is selected by a selector. A recorder records to a recording medium the imaging signals having the number of screens corresponding to the mode selected by the selector. A recorder records to a recording medium the imaging signals having the number of screens corresponding to the mode selected by the selector. A displayer displays a real-time motion image corresponding to the object images which are imaged by the imaging device during a time period that no recording to the object images which are imaged by the imaging device during a time period that no recording process is performed by the recorder.

Where a recording instruction is issued, a remaining amount to a battery is detected by detector. A determiner determines whether or not the remaining amount detected by the detector is equal to or more than a threshold value corresponding to the first mode and a second threshold value corresponding to the second mode. A controller enables the recorder when a determination result of the determiner is affirmative, and the disables the recorder when the determination result of the determiner is negative.

Therefore, when the remaining amount of the battery is sufficient, the real-time motion image is displayed before the recording instruction is issued, the image signal is recorded into the recording medium in response to the recording instruction, and the real-time motion image is once again displayed after the recording process. In contrary, when the remaining amount of the battery is insufficient, the real-time motion image continues being displayed irrespective of the issuing of the recording instruction.

It is determined whether or not the remaining amount of the battery is equal to or more than the threshold value corresponding to the selected mode, and the enabling/disabling of the recorder is controlled corresponding to the determination result. This enables to avoid a situation in which the process is suspended when the recording is still performed in both the first mode and the second mode. In addition, after the remaining amount of the battery falls below the threshold value corresponding to the selected mode, the real-time motion image continues being displayed as long as possible. This enables to adjust an imaging condition such as an amount of exposure, a focus, or a white balance, and to use as a telescope that takes advantage of a zooming function.

In contrary, Sakai discloses that a clock frequency is changed corresponding to the imaging mode, thus restraining consumed electricity. As a result, a longevity of the battery is prolonged. However, Sakai fails to disclose or remotely suggest anything about the process of determining the remaining amount of the battery, the process of prohibiting the recording corresponding to the determination result, and the process of displaying the real-time motion image when the recording

process is not performed. Therefore, it is not possible to reach the claim 7 from Sakai.

Kaneko et al. discloses avoiding a deletion of image data by issuing a warning message when the remaining amount of the battery contained in a memory card falls below the threshold value. However, Kaneko et al. fails to disclose or remotely suggest anything about the process of changing the threshold value corresponding to the imaging mode, and the process of displaying the real-time motion image when the recording process is not performed. Therefore, it is not possible to reach the claim 7 from Kaneko et al.

Hidetoshi et al. discloses that a motion image recording mode or a still image recording mode is selectable by a mode selecting switch, and a stopping a power supply from the battery to a plurality of circuits including a camera portion when a battery voltage falls below the threshold value corresponding to the selected recording mode. More specifically, if the motion image recording mode is selected, the power supply is stopped when the battery voltage is equal to or smaller than a threshold value "a", and if the still image recording mode is selected, the power supply is stopped when the battery voltage is equal to or smaller than a threshold value "b ($b < a$)". It is noted that when the battery voltage is equal to or smaller than the threshold value "a", and larger than "b", only the still image recording mode is allowed to be selected.

However, in Hidetoshi et al., the threshold value to be compared with the battery voltage is determined at a time of selecting the recording mode, and a comparing operation is not performed between the threshold value corresponding to the recording mode not selected. Accordingly, in a

case that the battery voltage falls below the threshold value "a" in a state that necessary to change the recording mode to the still image recording mode so as to resume the power supply. Furthermore, in a case that the battery voltage falls below the threshold value "b" in a state that the still image recording mode is selected, thereby the power supply is stopped, the power supply is not resumed.

On the other hand, in the claim 7, the remaining amount of the battery is detected when the recording instruction is issued, and the detected remaining amount is compared with the threshold value corresponding to the mode currently selected. This allows the real-time motion image to continue being displayed even if the remaining amount of the battery falls below the first threshold value in a state that the first mode is selected, and in addition, the real-time motion image continues being displayed even if the remaining amount of the battery falls below the second threshold value in a state that the second mode is selected.

In Hidetoshi et al. and the claim 7, this results in a large difference being appeared in operability when the battery voltage or the remaining amount of the battery falls below the higher threshold value. That is, in Hidetoshi et al., if the battery voltage falls below the threshold value "a" in a state that the motion image recording mode is selected, and the power supply is stopped as a result thereof, the power supply is not resumed unless the recording mode supply is changed to the still image recording mode. However, in the claim 7, assuming that the second threshold value is larger than the first threshold value, even if the battery voltage falls below the second threshold value in a state that the second mode is selected, the real-time motion image still continues being

displayed. That is, the claim 7 is superior in operability in that a mode changing operation is not needed for continuing displaying the real-time motion image.

Furthermore, Hidetoshi et al. fail to disclose or remotely suggest anything about detecting the remaining amount of the battery when the recording instruction is issued, and comparing the detected remaining amount with the threshold value corresponding to the current recording mode. Therefore, it is not possible to reach the claim 7 from Hidetoshi et al.

Misawa discloses recording the image data corresponding to the imaged object in the memory card via the internal memory. However, Misawa fails to disclose or remotely suggest anything about the process of changing the threshold value corresponding to the imaging mode, the process of prohibiting the recording corresponding to the determination result, and the process of displaying the real-time motion image when the recording process is not performed. Therefore, it is not possible to reach the claim 7 from Misawa.

Ejima discloses a high-speed continuous imaging mode, and a low-speed continuous imaging mode, and in addition, discloses structure capable of displaying the real-time motion image corresponding to the object image. Ejima, however, fails to disclose or remotely suggest anything about the process of determining the remaining amount of the battery, and the process of prohibiting the recording corresponding to the determination result. Therefore, it is not possible to reach the claim 7 from Ejima.

Next, regarding the combination of Sakai, Kaneko et al., Hidetoshi et al., Misawa, and Ejima,

no reference disclose or remotely suggests anything about detecting the remaining amount of the battery when the recording instruction is issued, and comparing the detected remaining amount with the threshold value corresponding to the current recording mode. Accordingly, it is not possible to reach the claim 7 from the combination of these references, and therefore, the claim 7 and the claim 8-12 depending the claim 7 are patentable.

As a courtesy to the Examiner, a partial translation of page 4, paragraph 0040 to 0048 of Hidetoshi et al. is provided in the attached appendix. It is believed that paragraphs 0040 to 0048 is relevant to claim 7.

CONCLUSION

In view of the aforementioned amendments and accompanying remarks, claims, as amended, are in condition for allowance, which action, at an early date, is requested.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact Applicant's undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, Applicant respectfully petitions for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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Appendix

[0040] Embodiment 1

Figure 1 is block diagram showing one embodiment of the present invention, Figure 2 is a circuit diagram showing structure of a remaining amount detection circuit 2 shown in Figure 1, and Figure 3 is a diagram showing a reduced voltage characteristic of a battery 1 shown in Figure 1.

[0041]

In Figure 1, 1 is a driving-use battery, 2 is a remaining amount detection circuit for detecting a remaining amount of the battery 1, 3 is a controlling circuit for controlling each portion, 4 is a displaying device for displaying reduced voltage, 5 is an audio circuit, 6 is an AF driving circuit, 7 is a recorder portion, 8 is a camera portion, and 9 is a mode selection switch for selecting either a moving image recording mode or a still image recording mode.

[0042]

Next, an operation in a case that the moving image recording mode is selected by the mode selection switch 9 is described.

[0043]

In a case that battery voltage detected by the remaining amount detection circuit 2 is equal

to or less than a (see Figure 3), reduced voltage is displayed on the displaying device 4 by the controlling circuit 3, and a power supply is cut-off from the battery 1 to the audio circuit 5, the AF driving circuit 6, the recorder portion 7, and the camera portion 8, thereby leading to a situation where each operation is not accepted.

[0044]

Next, an operation in a case that the still image recording mode is selected by the mode selection switch 9 is described.

[0045]

In a case that the battery voltage detected by the remaining amount detection circuit 2 is equal to or less than a and equal to or more than b (see Figure 3), the power supply is cut-off by the controlling circuit 3 from the batter 1 to the audio circuit 5 not used when recording the still image, and the AF driving circuit 6 that is large in consumed electricity and not always needed to pursue when recording the still image. As a result, the consumed electricity is rendered smaller than at a time of recording the moving image.

[0046]

In this case, this is the same as a normal still image photographing except for focusing by a manual operation.

[0047]

Next, in a case that the battery voltage detected by the remaining amount detection circuit 2 is equal to or less than b (see Figure 3), the reduced voltage is displayed on the displaying device 4 by the controlling circuit 3, and the power supply is cut-off from the battery 1 to the audio circuit 5, the AF driving circuit 6, the recorder portion 7, and the camera portion 8, leading to a situation where each operation is not accepted.

[0048]

It is noted that in this embodiment, descriptions are made regarding an example in which reduced voltage reference voltage of the still image recording mode is set to be lower than that of the moving image recording mode. However, in a case that the consumed electricity of a digital IC of the still image recording mode is larger than a case of the moving image recording mode due to circuit structure, a similar advantage is essentially obtainable as a result of the reduced voltage reference voltage of the still image recording mode being set to be higher than that of the moving image recording mode.